

# TROPICAL STORM THELMA (24W)

Thelma, the final tropical cyclone of the 1983 season, formed to the east of the Caroline Islands during mid-December. It was the only late-season cyclone to recurve in the western Philippine Sea.

Thelma was initially detected on 11 December as a weak surface circulation embedded in the near-equatorial trough near 4N 170E. Upper-level flow in the area was highly divergent due to the presence of a TUTT cell to the north of the low-level trough. A broad area of convective activity existed below the divergent upper-level flow, and was not confined to the proximity of the low-level circulation.

Over the next two days, the TUTT cell moved westward into a position to the northwest of the low-level circulation. An anticyclone formed over the low-level circulation in the lee of the TUTT, prompting the issuance of a TCFA at 131200Z.

Thelma remained in alert status for two and one-half days while moving rapidly westward. Repeated investigative flights by reconnaissance aircraft during this period provided data indicating that the circulation remained poorly defined. Concurrently, Thelma's appearance on satellite imagery indicated that the system was becoming better organized with well-developed outflow.

The first warning on Thelma, as a tropical storm, was issued when reconnais-

sance aircraft located a tight circulation center at 160100Z. MSLP was 996 mb and maximum surface winds observed were 40 kt (21 m/s). The forecast called for Thelma to continue moving west-northwestward for the first 24 hours, then shear and assume a westward track as an exposed low-level circulation. Three previous storms (Orchid, Ruth, and Sperry) had reacted in a like manner under similar circumstances. These storms had reacted to the passage of a mid-latitude frontal system by shearing under the pressure of enhanced but opposing flows at lower and middle-levels. As the frontal system approached to the northwest of Thelma, a repeat of these performances was expected.

Thelma's classic recurvature in advance of the front proved the fallacy of JTWC's forecast reasoning. Thelma's environment differed from its predecessors' in that it was not embedded in strong northeasterly flow at the low-levels. Although the northeasterly monsoon was well established in close proximity to the Asian Continent, Thelma was beyond its influence in the central Philippine Sea.

Thelma achieved maximum intensity of 55 kt (28 m/s) just prior to recurving on the 17th. After recurvature, Thelma dissipated rapidly under the effects of intense vertical shear (Figure 3-24-1). The strength of the upper-level flow impacting Thelma is reflected in the rapidity with which the system sheared while moving northeastward at speeds up to 27 kt (50 km/hr).

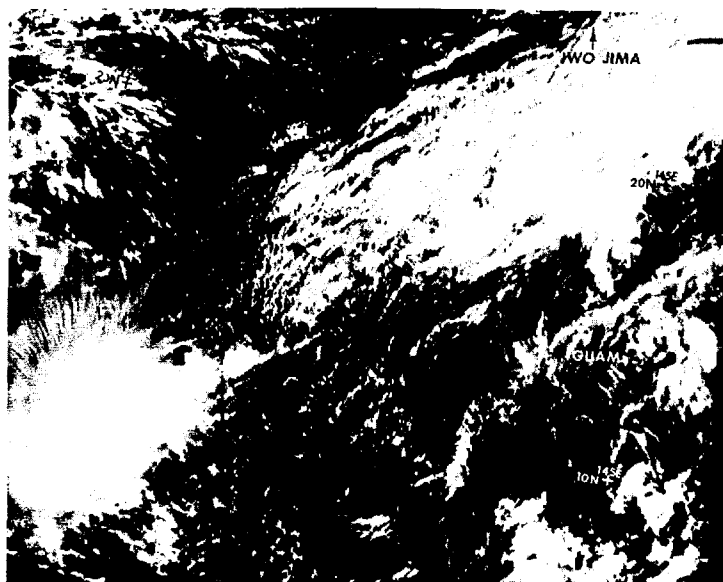


Figure 3-24-1. After recurvature, Thelma quickly dissipated and became absorbed into the frontal system. Only 24 hours after maximum intensity, the remains of Thelma were no longer distinguishable from the frontal system (upper right). The cloud feature at lower left is not associated with Thelma but is a "blow-up" frequently observed at the trailing edge of a front in the western North Pacific (180056Z December DMSP visual imagery).